Productization of User-Experience Design

Improving student's web interface at Arcada

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Abstract:

User-experience (UX) Design is a growing trend in almost every sector due to its flexible adaptation in the designing process with a focus on what people nowadays value the most: human experience. Its importance and relevancy have been on the increase, along with advancements in technology and the need for better products and services with a focus on intrinsic human value. This thesis research aims at presenting a practical outlook of the UX design framework by redesigning Arcada's student web ASTA. A rigorous study of the topic gave precious lessons and a foundation to answer the research question. Specifically, the research demonstrated the whole web design process and highlighted the effect that the user brought about to the ideation and creation of the design.

In terms of data collection, the action research approach was deemed suitable for this practical research study. Semi-structured interviews were carried out remotely with Arcada students before the design process to collect empirical data. The purposive sampling method was used to determine the study sample. The resulted insights had two purposes: understand the users' pain points with the current website and form a foundation that informs the visual design later on. To be more specific, the main issue was that the poor layout of the front page confused the users, while the displayed information was considered unhelpful and unengaging. The analysis brought about a series of visually appealing web-wireframes that took into account the users' issues and feedback.

The research stopped at delivering the visual design since its objective was to prove the importance of practicing the UX design framework even before the actual design process begins. This thesis limitation served as a basis for development work on ASTA to be carried out by the technical team at Arcada or further studies into Service Design and Customer Experience Design. UX framework proves a wide application possibility. Design thinking is a prerequisite mindset for anyone interested in integrating UX design in their processes.

Keywords:	User-experience design, design thinking, user experience, action research, UX/UI Design, web design, wireframe, prototype, usability, user research, service design.
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1 INTRODUCTION

People are moving from the materialistic era to a post-materialistic world where the efficiency and convenience of technology are a prerequisite, and now people want more than just good products. The growing demand for more personalized service and excellent value proposition calls for a more human-centric solution to complex problems. The shift is happening rapidly in the business world, where a company's strategies and business models are transforming as consumers are more susceptible to technological advancement. Consumers do not need to know how things operate; they expect it to work, solve their problems, and deliver the highest value proposition possible.

It is easy to realize that the only way to develop a medium that satisfies end-users is to change the way we approach and solve problems radically. The innovation process needs to place users at the heart of their strategic thinking and start designing for experience. As stated by Jesse James Garrett (2010), "every product that is used by someone has a user experience: newspapers, ketchup bottles, reclining armchairs, cardigan sweaters" (Oliveira, 2019). In this sense, when users interact with a computer system or a digital interface, they will also experience certain emotions. Therefore, the field of user experience focuses on optimizing the positive feelings of satisfaction, productiveness associated with using a system-based product. (Hassenzahl, M.,2019).

For educational entities, the change has not been so drastic, but it is starting to receive tremendous consideration. Technological advances have undoubtedly changed the way teaching and learning happens among teachers, students, and related parties. Students are spending more time on the web learning and searching for information, passive students turning into active users and seekers of information. While more and more teaching materials and classes are beginning to convert into online platforms, teachers are relying on technological advances to help them deliver more quality and automated work. To meet the constant need for change in an educational environment, a functional and sufficient platform can ensure that the learning and teaching process is to carried out seamlessly and effectively. It can also attain students and make their learning process enjoyable.

1.1 Web desgin

Web design trends from early 2010 to 2019 have not had many monumental discoveries, but how the web looks now compared to only five years ago has shown tremendous improvements and makes interactions between users and businesses improve beyond imagination. According to Andy Mcllwain (2019), Senior Marketing Manager at GoDaddy, nowadays, more internet activities happen on mobile than on desktop. A few reasons for this are the advancement of technologies, and faster internet bandwidth has allowed websites to have new and interactive designs that were impossible before. As e-commerce begins to take center stage in the 21st century, websites are the first and foremost contact point between businesses and their potential customers, putting an even more critical role in quality web design. Visitors demand better websites and better online experience, unhindered in abandoning the ones that are not up to par. Humans' habits are quick to adapt; however, it might not be the same with design.

Web design is the creation of the visual aspects displayed on the Internet and shown to the users when they visit a website. It often consists of layouts, colors, graphics, images, and content styles. Designing for mobile and tablets are becoming more popular since the mid-2010s compared to the traditional desktop browsers. There are two most common types of web design, responsive and adaptive design. In responsive web design, the page content moves or changes with the size of the device's screen. In the second type, the web content stays fixed to the most common screen sizes and the layout would remain unchanged. Consistent web design is an excellent way to show brand consistency; however, it will be dangerous when users cannot view the content on different devices, thus, ignoring the page altogether. (Interaction Design Foundation, n.d).

1.2 Arcada’s Studies web ASTA

According to the official ASTA user guide, ASTA is a web-based tool created at Arcada to aid the work of both school staff and students in their teaching and learning process. In ASTA, students can perform multiple actions, such as:

- View the range of courses, modules with descriptions.

- Enroll and cancel courses and degree programs.
- View the course results, study plans, and study period registration.

ASTA is a central tool for students and teachers to keep track of the courses and program information. Although ASTA provides adequate information, it is lacking the necessary design elements that meet today's need for delivering seamless interaction and high-value experience that is often expected nowadays. It might be easy to create a beautiful website. Nevertheless, to create a website that users enjoy using requires much more than aesthetics alone.

1.3 Purpose of the study and research questions

This research aims to implement the UX design framework to redesign Arcada's student web ASTA interface. By carrying out theoretical research on the topic of User Experience (UX), and doing one's empirical study on the subject matter, this research will directly give answers to two questions:

RQ1: Why should User-Experience design be implemented in the website design process? And How?

RQ 2: What are the pain-points that Arcada students are currently experiencing with My studies web ASTA?

1.4 Limitations

The questions to be answered are strictly related to designing the interface and visuals for the new interface, which includes the layouts, colors, graphics, images, and content styles. This project will demonstrate basic ideas around how incorporating the people from the very beginning of the design process will give outstanding results that will not only improve the perception of the website's appeal but also bring about benefits to designers and related parties. Creating a new and fully functional website will be beyond the scope of this thesis research. It requires tremendous data collection and strong technical know-how in programming and web analytics.

Moreover, the thesis has taken the desktop-first design, meaning it will be designed primarily for desktop-sized devices. Based on general feedback, Arcada students often use ASTA on laptops and personal computers rather than on mobile devices to perform actions relating to their study since bigger screen sizes allow them more flexibility and clarity when reading information.

1.5 Structure of the report

This thesis adopts the ITMRD structure for scientific reports, which stands for Introduction, Theoretical Background, Methodology, Result, and Discussion.

Chapter 1 *Introduction* includes the background of this development project, presenting its objectives, research aims, and questions.

Chapter *2 Theoretical background* introduces theoretical knowledge around User Experience Design, discussing significant concepts such as Design Thinking, Usability Testing.

Chapter 3 *Methodology* explains the methods being used to gather and analyze data. This is also an essential part of the User Experience Design process.

Chapter *4 Results and Findings* showcases the outcome of the practical research and data collection process.

Chapter 5 *Discussion* presents and evaluates the process and results of the development project according to the presented theory. Chapter 6 Conclusion summarizes the findings and suggests potential research possibilities that can be further developed from this study. The report concludes with a reference list and appendices.

1.5.1 Research approach selection

Due to the practical nature of this thesis project, the Action research method, which will be discussed further in the Methodology section, is used as the guideline to plan and collect empirical data. The data collection is based on interviews with the target users throughout the design process. The author will work closely with target users from the beginning of the design process to collect qualitative data that supports the planning,

building, and developing the website. Theoretical data is an essential part of this thesis. It places a strong foundation that is beneficial in building a good website and helps the author expand her knowledge horizon. The theoretical framework will be discussed in further detail. The figure below gives a basic outline of the research structure:

Table 1. Research approach applied in the thesis

Research Approach	Action Research
Research Method	Qualitative Research
Data collection	Theoretical Data: Collect from books, journals, bachelor's thesis, master's thesis, online research articles Empirical Data: user interviews.

2 LITERATURE REVIEW

The literature review, also known as the theoretical framework, explains the main topics of this thesis research by investigating the most prestigious researchers and trend-setters in UX Design throughout history. The research done by the industry leaders provides a strong foundation from which the first research question can be answered.

2.1 User experience design framework

User-experience Design (UX Design) has been moved away from just a business buzzword to a more well-established framework. Seemingly, almost every product and situation being touched, consumed, or used by humans will result in some sort of experience. Professor Marc Hassenzahl (2019) stated that Experience Design is the act of deliberately creating and sharing experiences. Hartson & Pyla (2012) believe that user experience can begin well before the action usage. It can start as early as when the user

catches the product's sight or system, and it may not end even when the user stops using the product. The feeling, either pleasure or displeasure, can continue in the mind of the users. The experience of how the user interacts with the product from seeing the advertisement to visiting the store, to buying, to unboxing, to using, to reviewing is broad and personal. While such a long and complex definition often receive criticism as it makes integrating and operating the process in an organization difficult, it needs to be as detailed and far-reaching as possible. In that way, it points out the need for multidisciplinary collaboration, where engineers, designers, customer service marketing people to work together and coordinate their efforts to define and execute a shared vision. (Hartson & Pyla, 2012)

UX includes all areas of interactions between the people and an organization's product. The first requirement for a good UX is to meet the needs of the customers, without hindrance. The second requirement is the ease and joy of use associated with using the product. Dedicated UX does more than just giving customers a good enough product. They provide a product that people need and love to use, even without knowing about it before. This kind of exemplary UX design requires a merger across multiple service disciplines, including engineering, marketing, industrial and graphical design, and interface design. (Norman and Nielsen, n.d.)

2.1.1 Elements of User Experience

The practice of creating, engaging, efficient user experiences is called user experience (UX) design. The UX design process ensures that everything the user involved with the product should be the result of a conscious decision. By breaking down the interactions into its component elements and examining them from several perspectives, one can ensure that they know all the scenarios of their decision. (Garrett, 2011)

In his book The Elements of User Experience, James explained that since the advent of commercial interests on the web and the booming in technology and web-based services, there has been a differentiation in the terminology that web user experience community uses when talking about the web. One group saw the web as a platform for functionality and practicality and is concerned with how people carry about their tasks. The other group views the web as an information medium, where people view the web as an information

channel, and they would pay more attention to what they are viewing and are keener to an appealing site. The two groups use different UX vocabulary when discussing what makes a great website, either Information Architecture or Information Design. Many terms have been born into different industries to suit the culture and the people better; however, it cannot deny the core concept, and most of the terms overlap in some ways and technically describe the same concept. In this research, the author will use the former group's language, based on the definitions by James Garrett, to introduce the elements of the student web.

The five elements provide the conceptual framework “for talking about user problems and the tools used to solve them” (Garrett, 2011). From the bottom up, the framework should be looked at from the most obscure to the most detailed. The choice made on the lower level affects the choices available on the upper level and vice versa. If a choice does not align with the process, it creates a "ripple effect" across the whole chain, which means it requires rethinking or reevaluation on a lower level, and vice versa. (Garrett, 2011).

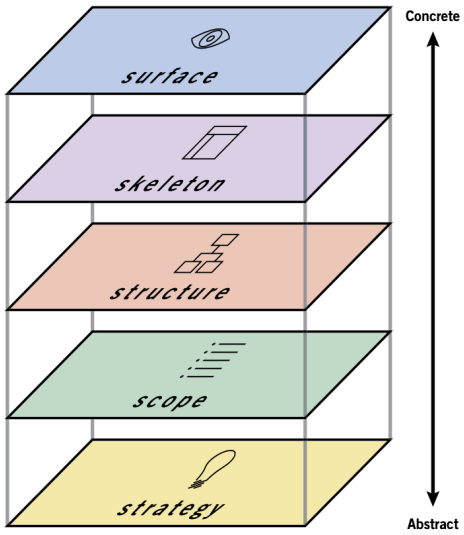

Figure 1. The five elements of User Experience (Garrett, 2011).

Surface: What people see on the screen. Every webpage consists of text and images, which is the top layer and is responsible for the users' sensory experience, where content, functionality, and visual design combine to form a design that appeals to the senses while meeting the predetermined goals of the lower levels. Some of the elements can be interactive or just serve as a still illustration. A wireframe helps visualize the finished products with suitable components. A style guide is essential to every design as it documents the overall design decisions of every aspect of the visual design process, such as the page grids, color palettes, typography standards, and logo standards. (Garrett, 2011)

Skeleton: Beneath the surface is the skeleton of the site: the design on looks and composition of the page's content, such as buttons, controls, photos, and text. The layout of the skeleton ensures that the elements on the website are optimized for readability and comprehension. A wireframe concerns interaction design, navigation design, and the arrangement of the elements to enable the users to receive information and interact with the product. The wireframe depicts all the components of a page, and how they fit together visually in a single document that can be used as a reference for visual design work and site implementation later on. People working on the strategy, scope, and structure process can help review the wireframe whether or not it aligns with the overall goal of the previous steps. (Garrett, 2011).

Structure: This is different from the Skeleton of the site, even though it also involves building and constructing frames of the web site and how it will work. Fairly, the structure is more conceptual and focuses on organizing pathways, how many pages are there, and how they fit inconsistently, and how the users see the hierarchy of the information. This process is also called interaction design. (Garrett, 2011)

Scope: The scope determines what features and functions that the people, both the users and the web owner, want and translate them into a specific list of requirements. This list of requirements is a product-functional specification that tells what needs to be built, included in a product, whatnot, what content, and functionality that is offered to the users. This step is crucial because it clarifies the abstract idea into specific elements. By seeing the entire scope mapped out, it is easier for everyone involved to see the common goal and plan of action at every level. A well thought out scope helps the project stay on track when sudden occurrence arises and will give clarity to the team member when too much

uncertainty from testing and deep thinking clouds their judgment. To get a good list of functional requirements, one needs to inquire the uses. Brainstorming is hugely beneficial because it gives people the freedom to express themselves. Group brainstorming session that brings a diverse group of people from different backgrounds can provide great insights into what the users want, what they actually need, and what they do not even know they need. (Garrett, 2011)

Strategy: The foundation of a successful website starts with a well thought out strategy. The user and the site owner's objectives will be taken into account to plan out the strategy and the site's scope. User needs and product objectives for the business are often the goals for this step. It must be clear what the people want from the product and how that fits in with other goals of the customer and the business. Strategy becomes scope when user needs and objectives turn into specific requirements for what content and functionality of the product will be. (Garrett, 2011)

What differentiates between a successful approach and a failed one boils down to understanding the problem they are trying to solve. Problems can arise anytime, so by identifying where this problem is on the five-element panel (whether it is on the surface level, skeleton, or structure), it is quicker to find the person with the right expertise to solve that problem. Secondly, understand the consequences of the solution. Any changes to a predetermined decision can have a ripple effect, meaning spreading on a large scale, up and down the chain. Also, it requires time to test whether the new solution meets the expectation of the people behind the process.

In many cases, a poor visual design will instantly give the user a bad impression. Clutter layout, poor usage, and irrelevant color schemes will bore the user so much that they would not care about smart interaction or clever navigation one has put in while working at the architecture levels. Likewise, making a visually stunning website would be a waste of time if the site cannot function properly and do what the users want. With that being said, a successful UX design highlights designing with the user in mind. (Garrett, 2011)

2.1.2 User experience cycle

A process is a structured composition that helps guide the work of a designer to ensure they do not forget any important aspects during the working process. The structure gives

order and discipline to observing, measuring, analyzing, and communicating in a project. In the context of interaction design and UX, the process is the UX life cycle. Part of the process can be repeated to fix, refining, or redesign for improvement, describing the iterative characteristic of a UX lifecycle process. (Hartson & Pyla, 2012)

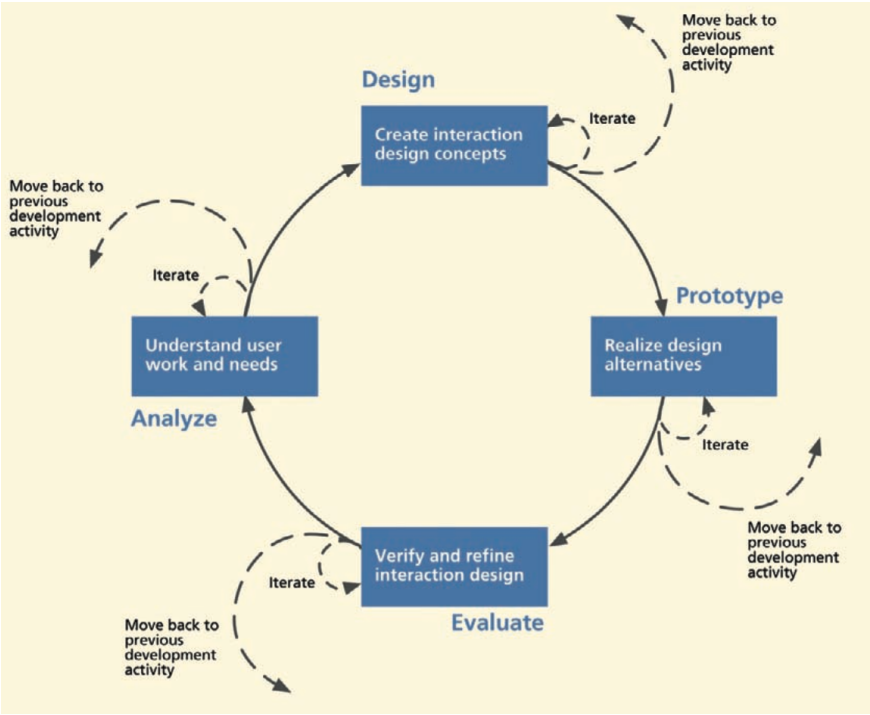

Figure 2. The User Experience life cycle (Hartson & Pyla, 2012)

The figure illustrates a rigorous method in designing user perception. It is worth noting that the results at every activity in the life cycle are to be evaluated somehow, which could be analyzing the results or testing with the users and customers.

1. **Analysis**

The first step of the UX process that aims at understanding the business context, user needs, and goals is to Analyze. Corresponding sub-activities that help with the analysis are often Contextual Inquiry, where detailed user research involves interviews and behavioral observation to understand sensory, mental, and physical actions and underlying reasons made by users. Contextual Analysis collects the raw activity data from Contextual Inquiry and organizes it into a contextual research analysis with an overall review

of the observation result or activity notes. Extracting requirements from contextual data into a compact checklist is another possible sub-activity that helps set the pace for the new design process by determining the functions, features requirements. (Hartson & Pyla 2012).

It is not easy for users to consciously describe what they do since they would have certain assumptions about existing tools, processes, and systems. Merely asking the users for their opinion will neglect the whole big picture as individuals have different perspectives on what the broader organizational operation is. Contextual inquiry is an early UX activity that places a strong emphasis on learning in detail about people's work. Only by interacting and observing people in their native work environment can one find out about what drives people's action, the intention, strategies, sub-conscious behavior and intricate work patterns that are usually hidden, without the person knowing. (Hartson & Pyla, 2012)

Contextual analysis often consists of a variety of activities such as transcribing, synthesizing, and sorting raw data gathered from the inquiry into a more comprehensible model or diagrams to interpret better and communicate identifiable work context, the interconnection of user roles and their activities. Such analysis would give a comprehensive insight into the broad and complex user's work domain, in which the design will be implemented and break it up into manageable pieces. (Hartson & Pyla, 2012)

After contextual studies, the resulting knowledge does not directly translate to design specifications, causing difficulties for designers to design correctly. Therefore, a small step of planning requirements is needed to get the information suitable for design-oriented practices. These requirements often describe what UX elements are essential to support user or customer work activity needs. To this end, Design-informing models will inform, drive, and inspire future design. It does not include what will directly appear in the design. Moderately it is more of a guideline, containing task descriptions, user personas, ideas, or contextual ideas, references to task descriptions, types of users, to social context, and so on that will be integrated and communicated throughout the design process. Design-informing models help keep the design focus and stay clear on set requirements. (Hartson & Pyla, 2012)

2. Design

Design thinking is a mindset that focuses on creating satisfying user experiences around a product or system that can evoke emotional impact, visual attractiveness, and value-oriented interaction. As a design paradigm, design thinking is all about pulling together all the pieces from art, craft, sciences, and technology into a design-driven, human-centered process. Three guiding pillars of Design Thinking are Ecological Perspective, Interaction Perspective, and Emotional Perspective. Ecological Perspective is to consider how a product performs within its external context and how it communicates with the surrounding environment. Interaction Perspective makes sure that users can operate and use the product to perform tasks, often through controls, sensors, or physical actions. Emotional Perspective is the value-based aspects that give meaning and emotion to the users. People often use a product as part of a need, yet this activity can be further and immensely enhanced when with ease and joy of use, or the aesthetics of social and cultural implications. (Hartson & Pyla, 2012)

When saying to design with the users in mind, it is impossible to design for the whole population of billions with the broadest range of features and functionality, claiming to be the best product. Opinions are subjective, so a good product for one may not be so for another. Therefore, it is better to completely satisfy a group of people rather than partly satisfy everyone. User personas are a tool for controlling the urge to cover everything in design. A persona gathers outputs from contextual data to create a hypothetical profile of a person with a life, a personality, and a problem that they need to solve. This tool helps people focus on finding solutions to that particular persona without worrying about unnecessary and conflicting discussions. (Hartson & Pyla, 2012)

After knowing whom to design for, the next step would be creating ideation sessions to generate ideas through sketches, mockups, and prototypes. Ideation is fast-paced and loosely structured, where customers and users are involved during the creation, exploration, and iteration of design to provide immediate and informal feedback for design ideas. Iteration performed at this stage is only conceptual design iteration, where different design concepts and ideas are evaluated and compared for feasibility. Storyboards are one type of evaluation, which gives clear descriptions of how people interact with the product in the form of storytelling with visual scenario illustrations with multiple consequent sketches. An intermediate design iteration happens when a few promising designs move

on to include layout and navigation. Low-fidelity or high-fidelity wireframes are often the outcomes of this step to present ideas. Wireframes are quick and easy-to-do sketches with boxes lines to define a Web page, screen content and navigation flow of the system, and even mockup interaction. Wireframes give a realistic view of how people see and use the product. A visual composite layout is a type of high-fidelity interactive mockup that showcases a pixel-perfect presentation of the system's visual elements, for instance, the colors, sizes, fonts, shapes, and spacing. (Hartson & Pyla, 2012)

3. Prototyping

The idea of prototyping is not a new concept, different fields and industries have been using them as a principle technique to test and evaluate idea alternatives quickly and inexpensively with real users and in a real environment. The level of fidelity can vary in terms of complexity and tone, but its goal reflects how "finished" the prototype is and not how authentic or detailed the underlying code is. (Tullis, 1990). Low-fidelity prototypes are suitable to present abstract concepts and are often efficient enough to observe any obvious usability problems without paying too much attention to design elements. High-fidelity prototypes offer polished and realistic looks on design and even system functionality. It includes high quality and refined design details that can go into final implementation. Depending on the team's resources and circumstances, mid-fidelity or fully programmed prototype is presented to the users. When a high-fidelity prototype reaches the high of its iteration cycle, it is ready to be coded by programmers and transitioned into the final objects for the final software product. (Hartson & Pyla, 2012)

4. Evaluation

Unquantifiable subjects such as teaching, learning, and experience are not so directly and easily measurable. Nevertheless, they can still be observed and measured based on performance-based indicators. Researchers measure those indicators and based their evaluation on them to design and improve features that can increase the desired outcomes of those indicators on experience. For instance, questionnaires' responses to a question about user satisfaction would indirectly examine how users are happy with the product.

When doing UX evaluation, a combination of Formative Evaluation and Summative Evaluation needs to be carried out. Formative Evaluation is a form of diagnostic testing

to inform and fix UX problems. Summative evaluation is about generalizing and assessing UX quality and how it impacts overall user experience under metrics and indicators. (Hartson & Pyla, 2012)

2.2 Design Thinking

According to the Interaction Design Foundation, Design Thinking is a design methodology that solves problems in a human-centric way, addressing so-called "wicked" problems, where both the initial problems and solutions are yet to be clearly defined. Design thinking falls under the big umbrella of UX Design, presenting more of a way of thinking rather than a scientific framework. Nowadays, Design Thinking is beneficial in exploring and defining business problems or product or service opportunities. In short, Design Thinking introduces the design approach into the business landscape (SAP User Experience Community, 2020).

The definition of Design Thinking was dated as early as the 1960s when the Nobel Prize laureate Herbert Simon first introduced in his seminar "The Sciences of the Artificial" the model consisting of seven major steps: Define, Research, Ideate, Prototype, Choose, Implement, and Learn. (Simon, 1969). This model serves as a base for variants of Design Thinking process models take after. Nowadays, there are many theories explaining Design Thinking, despite the differences in the number of steps, the general principles featured in Simon' 1969 model still apply. The Hasso-Plattner Institute of Design proposed a five-stage model at Stanford (d.school) is the most commonly used method. (The Interaction Design Foundation, 2019Its steps are shown in the following picture:

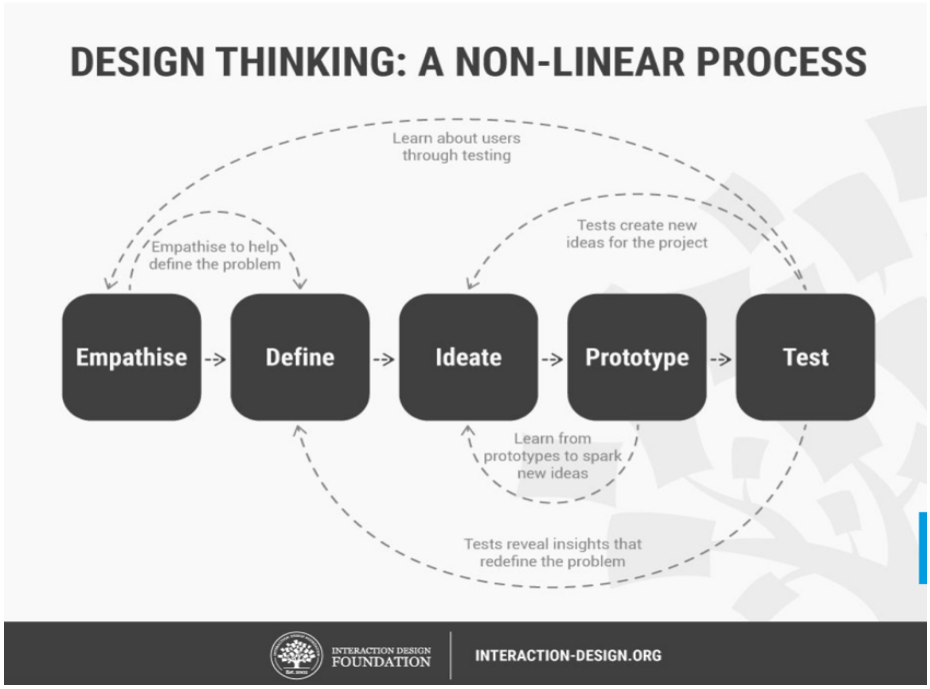

Figure 3. Design Thinking Model by d. school (Interaction Design Foundation).

This process consists of five stages, or as the author called it "modes" that designers are in Empathize, Define, Ideate, Prototype, and Test.

Design Thinking places a strong emphasis on Empathy; that is why it is the first step in the process. This step, also called User Research, involves consulting experts, observing, engaging, and empathizing with the people to understand their experiences and motivations, or even be a part of the environment where the people are to learn more about them. Engaging with people directly in their environment can reveal surprising insights into people's deeply held thoughts and beliefs most naturally and implicitly. (d. School Bootcamp Bootleg, 2013). Observation methods enable us to gain raw data, but they also offer ideas for designing a solution. If one is to empathize with users, they should always adopt a beginner mindset, set aside their assumptions about the problem, and be objective on how to gain users' perspectives. (The Interaction Design Foundation, 2019)

In the Define stage, one starts to go over all the information gathered to try to study, analyze and synthesize while defining and shaping the problem. (SAP User Experience Community, 2020). The goal of this step is to have a clear problem statement that shows

challenges and problems that a user is facing and how design-thinkers can help solve those problems or just to encourage the users to deal with the issues themselves with the least amount of difficulty. A well-scoped and articulated problem statement will help guide the next step, which is Ideation, to generate more and even better solutions. (The Interaction Design Foundation, 2019)

Ideation is where the most thinking, and brainstorming takes place to find out new solutions to solve the problems. There is an abundance of ways to conduct a brainstorming session with hundreds of Ideation techniques, such as Brainstorming, Brain Dumping, Worst Possible Idea, Sketching, and many more. It is imperative to allow free thinking or "outside of the box" thinking, pushing for the broadest range of ideas to look for alternative ways to view the problem and innovated solutions. (The Interaction Design Foundation, 2019). A great transition step to Ideation is to reframe assumptions and obstacles into questions that one can solve, thus making it easier to draft ideas that are actionable and trackable. Finding answers to questions such as "How-Might-We...? “creates a subtle shift in the mind from uncertainty (which is uncomfortable) to curiosity (which is exciting) (Knapp, 2016). After a few rounds, it can start to show where the most compelling ideas flow. After all, there should be a handful of options that is worth further consideration.

The experimental phase, or prototype, the solutions for the problems will be reviewed in order to find out the optimal outcome. Several inexpensive, low-resolution prototypes are produced with the solutions implemented within to test out the user experiences. This process happens several times where designers rigorously try out different options and iterate their designs by learning what works and whatnot. The solutions are either accepted, re-examined, and improved, or rejected if they do not work for the users. By the end, the design team will have a better understanding of the problem, the product's constraints and have a better sense of how real users behave, think, and feel. (The Interaction Design Foundation, 2019)

Prototype and Test often go hand-in-hand rather than being consecutive steps one follows after another; however, it is often the case that planning and executing a successful testing scenario is a considerable additional step after creating a prototype. (An Introduction to Design Thinking Process Guide, 2019). Referring back to the picture above, during this

process, the results generated during the testing stage will create new ideas for the project, problems (Ideate), and even the initial data insights about the users and their thoughts, habits, and feelings (Define) could even iterate. Although this is the final phase in the model, and the same goes for any stages of the model, alterations and refinements can still be made by going back to the previous steps and narrow down the options and eliminating ideas that do not work. In this way, valuable information is continually used to understand the problems and solutions and redefine the early research questions, processes and designs can be cheaply and quickly iterated.

Unlike analytical thinking, which means the breaking down of ideas into small actionable choices, Design Thinking is a creative process where ideas are built up through ideation and prototyping phase. Judgments and assumptions about the quality of the output are withdrawn to give space to creative and free-thinking in the early stages of the process to maximize input. (SAP User Experience Community, 2020). According to Baeck & Gremett (2011), Design Thinking Paradigm is more user-centric and creative in finding solutions to problems, compared to traditional design methods. They stated that "Design Thinking defies the obvious and instead embraces a more experimental approach." (Baeck & Gremett, 2011).

The five-stage model acts as an action guide in a design project - or any innovative problem-solving project. While the stages do not have to be sequential, it can happen at the same time, repeated, or switched interchangeably depending on the situation and occurring problems. Design Thinking Process is a non-linear, flexible process where designers continuously gain new insights, developing new ways of viewing the products and their users and the problems they face.

2.3 Usability

As mentioned, the term User Experience usually refers to the user's feelings, including the effects of usability, usefulness, and emotional impact. On the other hand, usability is the pragmatic component of user experience, including effectiveness, efficiency, productivity, ease-of-use, learnability, the pragmatic and non-emotional aspects of user satisfaction, and also qualitative data about usability problems. (Hartson & Pyla 2012)

Usability falls under the umbrella of UX, and while there are many definitions, it involves many things that would ultimately contribute to user satisfaction, engagement, and product aesthetics. A 2015 web usability research paper carried out by Huff Industrial Marketing, KoMarketng and BuyerZone on what B2B web users want from their partner website, showed that 46% respondents leave a website when they could not find out what the company does, 44% left when there is no contact information visible on the site and 37% leave due to poor designs or navigations. (Huff, Edmond, and Gillette, 2015, p.15).

There are three elements when determining the usability of a product: look, feel, and usability or functionality (Soegaard, 2019). An excellent usable design will spark the joy and ease of use, making it a breeze for users to achieve their goals. On the contrary, when a design has a poor visual, and the functionality is confusing and full of errors, users would associate it as a bad experience. In 2001, Whitney Quesenbery, the UX and Usability Expert and former President of the Usability Professionals' Association (UXPA) (Quesenbery, 2019), included five characteristics a good product must have: Effective, Efficient, Engaging, Error Tolerant, Easy to Learn. (Komninos, 2019)

Effective: describes how well and accurate users can achieve a specific goal through the product. For example, an education website interface would allow the students to find all the information about their studies easily without faults. The design should be as clear as possible for the users with a minimal presentation of choices, clear and easy to understand the terminology, and appropriate to the task. A good rule of thumb in design is that less choice means less thinking. When users do not have to overthink ambiguous situations and solely focus on acting, they tend to perform better and with higher accuracy. (Komninos, 2019)

Efficient: Different from Effectiveness, Efficiency concerns primarily with how quickly a task can be completed, which can be translated to metrics such as clicks, types, or the total "time on task". Navigation design elements like menus, links, shortcuts, buttons all affect a site's efficiency. Using the same example above, an excellent way to boost efficiency is to add shortcuts to frequently used pages in the system, as this allows users to get exactly where they want to go without going through the whole navigation menu. (Komninos, 2019)

Engaging: No matter how easy it is to use a product, it cannot retain users if it is not pleasant to look at or gratifying to use. The visual design is, without a doubt, plays a significant role in web design, but how to design right is more valuable than to design beautifully. It depends on the likes and needs of the target users and the website's purpose, the choice of style of the visual presentation, typefaces, graphic images, color palettes, layouts, and so on need to be carefully selected to serve that purpose. A style that might be aesthetically pleasing for one site industry is not necessarily the same for another. Therefore, designing with context is also key to engagement. (Komninos, 2019)

Error Tolerant: Humans are far from perfect and creating error-free computer systems. The next best thing is to take measures to prevent errors from happening and make it tricky to make wrong and invalid actions. Avoid technical jargon, advanced language. Design elements such as links and buttons must be clear and distinctive. Provide simple and clear instructions or examples of data entry. Provide confirmation when the filled-in information is correct. (Komninos, 2019)

Another way to tolerate error is to help the users recover from any errors that have occurred. Make it possible to "Undo" or backtrack. A website that provides the opportunity to go back and cancel what they have done is less likely to cause a negative experience to the product.

Easy to Learn: Websites need to have new functions and features to deliver more to users. While this is inevitable, and change is happening at a constant pace, designing for ease of learning allows users to slowly adapt to the new interface and adopt the new features based on their knowledge. Whitney Quesenbery (2001) mentioned Predictability, where interface elements are consistent throughout the different versions. The terminology does not change, design elements and controls are in familiar locations, where the users expect them to be. Designers need to study their users to map out predictable locations and features to understand their needs, wants, and behaviors. Only then even when introducing new functions, they would be just as well easy to learn. (Komninos, 2019)

Wixon and Whiteside, in 1985, was already ahead of their time when presenting at Digital Equipment Corp in the 1980s, quoted in Macleod et al. (1997):

Building usability into a system requires more than knowledge of what is good. It requires more than an empirical method for discovering problems and solutions. It requires more than support from upper management and openness on the part of all system developers. It even requires more than money and time. Building usability into a product requires a straightforward engineering process… It involves empirical definition, specification of levels to be achieved, appropriate methods, early delivery of a functional system, and the willingness to change that system. Together these principles convert usability from a "last minute add on" to an integral part of product development. Only when usability engineering is part of software development as the schedule can we expect to regularly produce products in which usability is more than an advertising claim. (Hartson & Pyla, 2012)

3 METHODOLOGY

Typically, there are three main research methods: qualitative, quantitative, and mixed methods. Since this study aims to develop insights into the user experience on the ASTA website, the focus would be on the subjective opinions, beliefs, and feelings of individual participants. In order to measure these intangible and complex factors, the qualitative research method is chosen to collect and analyze data, due to its ability to provide a contextual description of how people experience a given research problem. Compared to quantitative methods, in which the data collection process follows a rigid and identical system for all participants, qualitative methods allow for flexibility and spontaneity in the interaction between the study participant and the researcher. There are three common qualitative methods, participant observation, interviews, and focus groups. The questions presented in qualitative studies are often "open-ended" questions, and many adapted slightly according to the participant's response. The theme or main topic around the interview questions are kept while allowing the participants to answer in their own words freely. This flexibility nature of the research gives ways for the research problem to be studied and examined in great detail. (Mack, N., et al, 2005)

The nature of the UX design process, as discussed in great length in the above sections, is to have the users at the center of the process, being the informant to inform the design decisions and steer it on the right path. With that being said, when thinking about a

research approach that would best demonstrate these characteristics, the traditional longitudinal study does not seem to reflect what this research aims to achieve correctly. Therefore, the author decided to take an unconventional path and use action research as the research approach for this study.

3.1 Action Research

When considering how to answer the research questions in the best possible way, Action research takes up a similar process as the UX framework and allows for flexibility in collecting data from the users. Action research (AR) is a qualitative research method that combines the practical action and the theoretical research component of a subject matter to work towards an outcome while generating a new form of understanding (Burns, A, 2015). In the simplest sense, it is learning by doing. AR is a systematic process where participants can openly and freely discuss, plan, and reflect on achieving greater knowledge. (Adelman, 1993).

Although there are many areas of application, the term is quite popular and widely used in educational institutions. According to Eileen Ferrance (2000), in a school setting, AR is a collaborative activity among colleagues as a way to find solutions to everyday problems or to systematically improve teaching instructions and enhance students' engagement. Rather than focusing on the theoretical or in books, AR allows for a more reflective process where inquiry and discussion play a central role in the research. It is not about finding out what is wrong with the system, but rather a quest for knowledge on how to improve and make things better. The process of AR is an excellent tool for practitioners in assessing needs, documenting inquiry, analyzing data, and making informed, desirable decisions quickly.

Kurt Lewin (1890-1947), an educator and social psychologist whose work on AR dated back in the early 1920s, was among the first to discover and utilize open discussion to improve productivity (Ferrance, 2000). However, Lewin did not develop a conceptual structure that defines different power actors in the modes of production (Adelman, 1993). Nevertheless, after Lewin coined the term in the literature, his work has been adapted and applied in different sectors and has become increasingly popular. (Quirke, 2020)

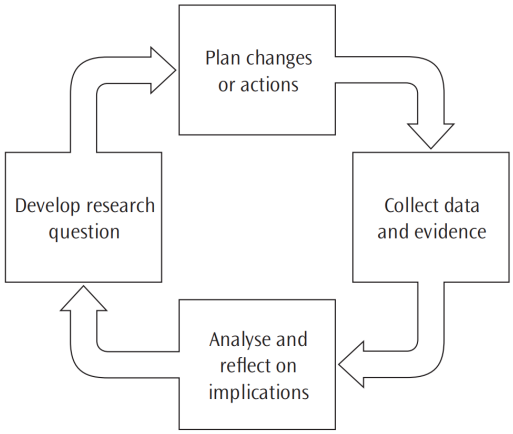

Figure 4. A simple Action Research process (Gaffney, 2008).

The figure above outlines the basic pattern that describes the AR process as a circular model based on Lewin's works. Initially, a person sets out a quest for innovation and improvement. Questions are raised, and activities are explored to answer these questions, plans are made and implemented with the chosen solution. During and especially after the implementation process, practitioners would closely observe and take note of the practice and its effectiveness. All of the gathered information would be the material to decide on new questions that need to be researched and tested. When the decision does not meet the requirement for change, another solution will be tested, and the cycle starts again. (Gaffney, 2008).

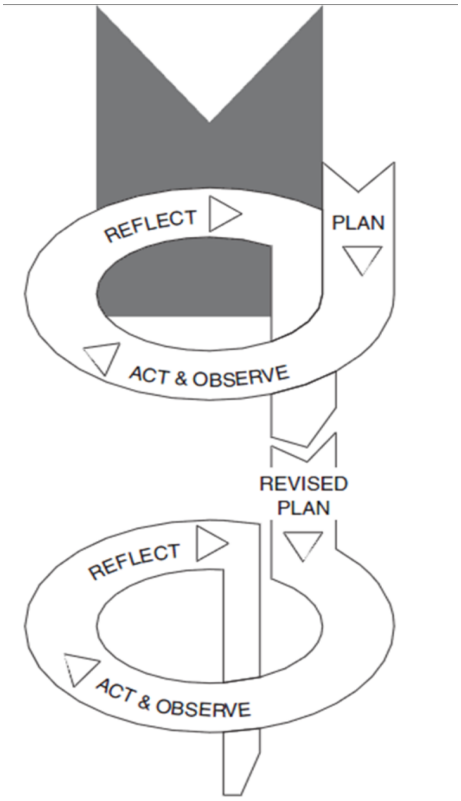

Figure 5. Detailed Action Research process (Kemmis and Mctaggart, 2005).

Kemmis and McTaggart's (1998) strategy is based on a similar four-step process, yet it takes a step further and clearly describes the iterative and self-reflective nature of the research over time (Cardno, 2003). This includes: Planning, acting, observing, and reflecting. Kemmis and McTaggart acknowledge that individual stages specified in the AR Spiral model may overlap, and each time the process returns to the planning stage, reaching a deeper level of understanding. The stages evolve, and the initial findings from previous stages feed into the changes of the later phases and could easily become obsolete as a result of learning from doing. AR process takes the researchers through a cyclical process of deepening recognition, in which the learnings happen not just at the beginning and at the end, but throughout the process. (Emerald Publishing, 2020)

Some may fear that AR is not an excellent methodology to be used in degree research since it is quick and easy to perform without much preparation, and the research product cannot be predetermined. However, after decades of adaptations, AR can be recognized as a form of action inquiry that uses recognized research techniques to guide the action

taken to improve practice. AR research's proposal is different from that of traditional research. The latter tends to focus on either deductively or inductively deriving a hypothesis from theory and set out to prove such a hypothesis. Meanwhile, the former focuses more on finding measures to improve current practice. AR is essentially a problem-solving strategy. Using this method, practitioners are encouraged to question their approach and continuously review their actions for constant improvements. AR is not research just for the sake of research but for the sake of improvements. (Quirke, 2020)

The purpose of this project is to improve the user experience on an existing system. The process of collecting empirical data of this project follows the AR process. It will get a better understanding of the subjects and then propose antaction plan. A situation analysis asking a simple question such as "What is the current website looks like?" is a prerequisite for planning what to do in the first action research cycle. This is the same as the planning stage in Kemmis and McTaggart's model. At this step, the author will interview students at Arcada to confirm her initial hypothesis that the current ASTA webpage lacks the visual attention and needs to be improved and propose a research objective. The answer to this would inform what intervention to take and how to monitor its effects, as in: "How can the current site be improved to increase students' satisfaction?". The plan of action would be that the author needs to interact with the users and get a clearer understanding of the critical issues. A rigorous study will then be carried out to form a foundation for a reliable and valid solution. A formulated decision would not only reflect on the initial research question but also give practical solutions to the issues and can be tested with the users for feedback and improvements.

3.2 Usability testing

According to Chris Nodder, Usability Testing involves observing representative users interact with a product's mockup and see how they react first-hand. It gives designers immediate valuable feedback so that improvements can be made, thereby developing a more suitable site or application with the right features that the users would enjoy using. Usability testing is the tried-and-true method to dismiss endless arguments among team designers by moving the discussion away from focusing on what is right or wrong, what people like and dislike, to proving what works and what does not. Usability testing can

be done at any stage of the design process, from early paper prototype concepts through to the finished code. The earlier in the process usability testing starts, the cheaper and easier it is to make changes based. Carrying out a usability test in the early stages can help save development time and money while eliminating guesswork and arguments on what works and whatnot. (Krug, 2014)

In 1993, Jacob Nielson analyzed eighty-three of his product studies to identify how many usability problems could be found after a certain number of tests. The conclusion was surprising: 85% of the issues were found just after five people. "The number of findings quickly reaches the point of diminishing returns," Nielsen said. Testing with more people does not lead to more insights. It just creates a lot more work to analyze. Jake Knapp also tested out this theory in his design sprint and confirmed the pattern: Five users is a good number to start with to work out most of the problems. It is better to focus on fixing the first 85 per cent and test again. (Knapp., J, 2016).

3.3 User interview

A user interview is a UX qualitative study technique in which a researcher asks one user several questions around a particular topic with the ultimate aim of gaining further knowledge. Unlike focus groups, which involve multiple users at the same time, user interviews are one-on-one sessions (Pernice, 2018).

A user interview is a great way to get into the users' minds and understand what they think about a site, an application, a process, or a certain product. The outcome usually centers around what they think is crucial on te site, is it memorable and what needs to be improved. According to Kara Pernice (2018), an expert researcher at the Nielsen Norman Group, a user interview is suitable in a variety of situations. Firstly, an interview can be carried out even before a design is available to find out more about ideas, building user personas, journey maps, and users' stories. Secondly, when having a design, interviews enrich the contextual inquiry study by supplementing observation with descriptions of tools, processes, bottlenecks, and how users perceive them. Thirdly, at the end of the usability test to collect verbal responses related to observed behaviors. Notably, after the behavioral observation of the usability study, the interview needs to be done because when the researcher asks questions beforehand, participants will unconsciously pay

attention to whatever features or issues discussed, causing the behavioral testing to generate biased results.

User interviews are very versatile, come in different forms, and serve different goals. There are predominantly three types of interviews. First of all, structured interviews have carefully scripted questions display in the same way towards many respondents. They often contain lots of closed questions and a few open questions. Sometimes the interviews will present the participants with some predetermined options to decide. As a result, structured interviews are not often used in the early stage of the design project because they do not generate many new data. With that being said, this method would be suitable when interviewing lots of people, and the outcomes need to be compared to one another. Secondly, unstructured interviews do not have any prepared questions, though there are some specific themes or topics. This method is excellent to use when one has little to no knowledge about the domain, to begin to learn more about the users and their main characteristics. However, it is essential to avoid leading, closed, and vague questions to generate good results. Finally, semi-structured interviews have a few questions prepared in the form of an interview guide or discussion guide. These questions are generally open-ended and allow the participants to talk freely. Then the interviewer will follow with further questions. Interviewers have the freedom to change the order of the questions in the guide or to probate a response over one specific question. It is the best type of interview to help increase awareness about the users by generating good quality data and providing sound knowledge. (Pernice, 2018)

3.4 Data collection

Usability testing and user interview methods bare a striking resemblance to one another. Both are used to gain users' insights, and even interviews can be done after the usability testing; however, they are different. Unlike behavioral data that captures how participants interact with a design, data from interviews is self-reported — it reflects users' perceptions and feelings about a process, a site, or an interaction. (Pernice, 2018). In this thesis research, the author decided to conduct semi-structured interviews before the actual design process. Since no design is readily available for testing, the author can only rely on the users' experience with the current web site and ask for their opinions and suggestions.

The interview is about figuring out where the problem lies in real-time based on real comments rather than speculating how the users will think. This is especially useful when no prior expertise of the current issue, as well as no problem-solving strategy, has been formed.

The author will use a purposive sampling method to choose six participants for the user interviews based on the study objectives and theory discussed in section 3.2 about the optimal number for user testing. Purposive sampling is one of the most popular sampling methods used in qualitative research, where data collection and data review are done together. (Mack, N., et al, 2005). During the interview process, the interviewer does not have to follow the interview guide strictly. The respondents were encouraged to talk freely based on the probing questions and may give suggestions or jump to new ideas whenever deemed necessary. On the other hand, the interviewer can use literature review, theories, or personal judgement of the subject to come up with additional questions, if necessary, during the interview to best correspond with the interviewees' answers.

The session setting will be a remote interview, where the author schedules a 15-minute calling session with respective interviewees. The author predetermines the focus point of the interview and prepares a shortlist of questions (see Appendix A) to lead the discussion. The questions are sent to chosen interviewees beforehand so that they can grasp the research's field of interest and prepare themselves for the interview. There are five open questions, and one rating question on a Likert scale, half of which are related to the current website, and the other half are about suggestions for the new web design. The content of the interview questions is chosen to support not only the data analysis but also provide insight to answer the research questions determined at the beginning of the thesis.

3.5 Data analysis

During the interview, the author took all of the notes directly on the computer, using a standard word processing software. Hence, there was no need to transcribe any handwritten notes, and the data analysis could start right after the completion of the data collecting process. The notes were categorized by respondents, hence, the collected data was subjective, unstructured, and rich in context. The small number of participants greatly reduced the work of reading long, unedited transcripts to look for similarities and

distinctions. The author noticed after a few respondents that some information and opinions about the website's current visual were overlapping, while new insights on the suggested solutions emerged from some answers. These findings were then organized according to question types and combined into a single document for ease of investigating and drawing solutions. After a complete analytical report was done, the solution was drafted following the elements of user experience design by James Garette as discussed in section 2.1.1.

4 RESULTS AND FINDINGS

As the aim of this thesis is to identify and implement the user's perspective in redesigning the interface for the ASTA web site, the data collected will be analyzed in two parts: The current obstacles that the users are currently experiencing and their proposed suggestions on how to improve the site for a better functional and attractive site. The findings from the user interview sessions are presented and investigated in detail in both writing and displaying figures in the following sections.

4.1 ASTA overview

It is mentioned earlier that ASTA is a multi-functioned website where both students and teachers could get access to perform course-related actions. In the student platform, the home page is built up from three main columns. The first column depicts personal information of the user, such as contact details, study place, credits information, and the option to view personal curricula. The second column gives out the news from ASTA, re-exam dates, and room reservations. The last one displays the current course enrollments and exam results. The top right corner gathers additional options of the site, such as languages, colors, and report bugs. The site's main function is built around three options that the user needs to choose consecutively and then hit the "Go" button to reach the destination page.

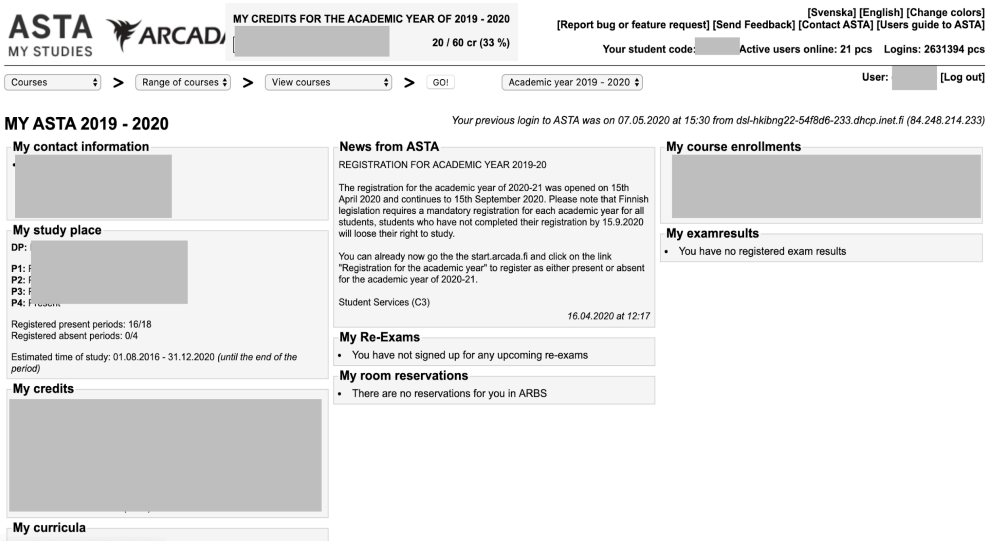

Figure 6. ASTA Student Home Page (excerpt from the author's account).

Figure 7. Menu options (excerpt from the author's account).

4.2 Interview results

The interview questions are formed based on the overall objective of this thesis, which is to answer the research questions. The first three out of six interview questions in the interview targeted the pain points that the users have with the current website. Most of the respondents use the site regularly to check their grades, credits, and sometimes to browse and enroll for courses. When being asked about the home page, all of the respondents said that the information on the site is not very appealing. While the information is abundant, it is not very clear and personalized. The page was not very responsive as some browsers cannot read the site, also lacking attractive visual cues that retain the users to the site. How the site is structured, and the pages were linked together was not a big issue, but it could be reorganized to improve visual attraction. For example, . The option to change language is a good feature, yet the button is small and often hard to detect amidst similar looking ones. The other main issue with the site is that it is quite lagging and takes a long

time to process the user tasks. This matter can be understood as the system that runs ASTA could be slow and insufficient while holding a tremendous amount of data that needs to be used and updated frequently. While this problem is taken into account by the interviewer to know the user perspective, this study will not provide a solution because it is outside the research objective and aim.

The second half of the interview focuses on gathering wants, opinions, and further feedback from the users. Most of the respondents want the course registration process to be more painless and includes fewer steps. The information available on ASTA is already very detailed and carefully structured, and students can get information on everything they need. However, it would require the users to perform multiple click-throughs and digging on the site to find the information they need. This causes frustration in users, and some people would leave the site, thinking that it does not have what they want. One way of achieving this is to change the navigation bar from having three steps selection (figure 8) into a horizontal tab menu bar with all the options laid out (figure 14).

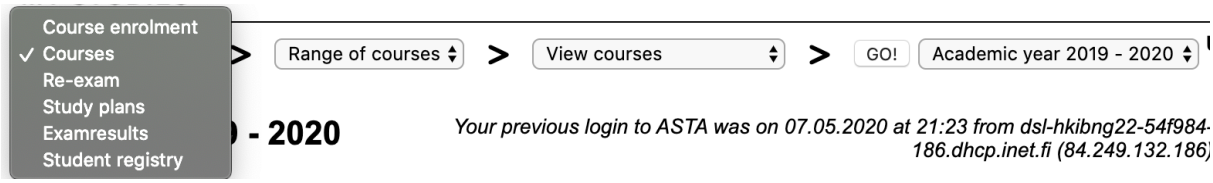

Figure 8. ASTA current menu option (excerpt from the author's account.)

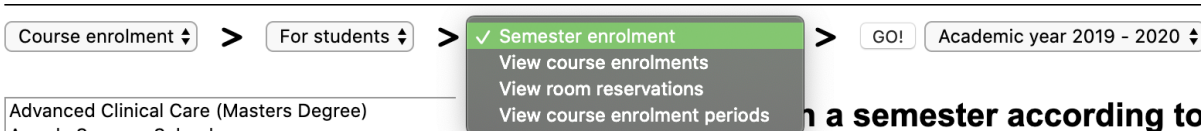

Figure 9. ASTA current menu option 2 (excerpt from the author's account).

4.2.1 Findings

In this part, certain features of the ASTA site and the overall usability is discussed in further detail. The author will also give some thoughts on what the final solution should entail based on those findings.

- **Frontpage:**

Most of the respondents said that the amount of information concerning the courses and credits on the current front page is good and useful. They would want to include Grade Point Average (GPA) scores and leave out Exam results and Room reservations. Some students find the Room reservations section unnecessary because they would often use other methods to check for the room instead of ASTA. The reason for this is that ASTA is not very responsive on mobile devices, and it also requires logging in, which takes extra effort from the users. The original comment from the user:

"It is quite complicated on the first page. There are two parts I hardly concentrate on, including my room reservations and exam results. Room reservations could be easily checked on Tuudo or ARBS together with your study schedule". (Respondent from interview)

As stated on the website, Tuudo is a mobile app that serves as an all-in-one resource provider for higher education students' daily needs; this includes course schedules, exam enrollments, and even public transport timetables. (Our story - www.tuudo.fi, 2020). Tuudo is created by an external party, which is a Finnish software provider, while ARBS is Arcada's internal scheduling site designed specifically for viewing course calendar and room reservations. It can easily be seen that nowadays, students are increasingly turning to Tuudo as it is much more adaptive and useful for students.

In addition, considering the crucial elements for students, such as student code, change of language option, and basic information on completed courses, need to be highlighted, making it clearer and clearer to the users. Elements such as Feedbacks, Report bugs, and Feature Request are not so compelling to the users but are necessary for web developers.

By limiting the visible features, the front page will be much clearer, and more useful content could be made instantly accessible without too many click-throughs. A respondent suggested that having extra links that give them access to outside pages such as Itslearning, ARBS, and Outlook from ASTA would be a great feature since it is convenient. For exam results, Itslearning, which is an online study environment, is already a better platform because it gives immediate notification to the students when the teachers upload the grades with their feedback. They would have immediate access to where they need to be without going to another medium. Some comments from the respondents (RE) regarding this finding is as follows:

RE_1: *"It is quite complicated on the first page. There are two parts I hardly concentrate on, including my room reservations and exam results."*

RE_2: *"I would like to have a mean GPA in ASTA front page. They only show your total credits, but your mean GPA is not listed. If you want to know your GPA, there will be only one way of asking for a transcript of record."*

RE_3: *"I want ASTA front page to have fewer words and cut off some unnecessary parts. However, it should still be informative."*

RE_4: *"I could suggest using other aesthetic fonts. I dont think exam results should be a choice option on ASTA. Because you can see your overall grade for each course on My Course Enrollments and track your grade and comments on each assignment on Itslearning."*

RE_5: *"I think it's a bit too much info as I don't need to see my room reservation (I can check it on ARBS or Tuudo)."*

- **User flow:**

When asking about the user flow on ASTA and how easy it is to carry out their tasks, all of the respondents agree that checking the accomplished credits, courses, and grades are the most perceptible. In contrast, browsing for courses, checking study plans, and registering for courses is not so obvious. The former is easier because the information is

put on the front page while the latter takes more time and effort digging deep into the site and navigating around to find the way. Two respondents stated that it is confusing as to which courses are compulsory and which not while they are on the course page, which makes enrolling for new courses difficult. The poor user experience also accompanied the many choices provided to the users when they need to go to a certain page. For example, course enrollment and courses tabs are places where students can go to and register for courses, making users have to go back and forth between pages to see which ones are the right one they are looking for. Below are some responses from the interviewees to give some context to the study:

RE_1: *"ASTA is too slow when switching tabs to reach the information needed."*

RE_2: *"Sometimes the ASTA website is quite lagging, for example when I hit a button it takes a while to load. It would be great if the site can upgrade its speed."*

RE_3: *"ASTA's slow response keeps me annoyed every time I'm using it, especially the courses' descriptions part."*

RE_4: *"Registering for courses is quite difficult because there are many sections indicating where I can see the courses, so it was a bit confusing."*

4.3 Solution

Building websites is highly visual-oriented, yet before jumping to the visual design and decide what colors the website has or how it will look like, it is crucial to create wireframes. A website wireframe is a visual guide that depicts the layout of the page, including the arrangement of interface elements such as texts, pictures, and navigation systems. It gives an overall sense of how they work together and do not often include color, typography, or graphics since the main aim is to demonstrate the page behavior, functionality, and priority of content. (Brown, 2011)

As mentioned in section 2.1.1, the designing process can be broken down into five elements, from the most abstract concepts to the most basic ones, ensuring that the whole design is aligned with the users' needs and the design's objectives. The wireframing

process will follow this framework and will be presented both in writing and visual as follows.

4.3.1 Strategy and Scope:

Since the main objective of ASTA is a course registering platform, much attention is placed on delivering the most efficient path for students to find, browse, and enrol for courses easily. Therefore, the top navigation, which is also the backbone and the site's scope, will include a Home page, Study plans, Courses, Student Registry, Order Certificates, and Instruction.

Specifically, study plans will give a suggested list of courses relating to a certain degree program that a student needs to take for the whole period of study to complete the degree and graduate. The current version of ASTA has this function, yet it is unclear to the users. By placing this function at the top navigation bar, students can easily access their study plan from the front page and know what courses they need to take and can register for it directly from there. This helps them become more proactive in their study journey. Student Registry is adapted from the current site, where information on completed courses with its grades and credits are listed in detail. The possibility to order a study certificate is also deemed useful by the respondents, so it would also be included in the navigation bar.

4.3.2 Structure:

Based on the above section 2.1.1, the structure of the wireframe is similar to a site map, which is organizing pathways and fitting the pages together.

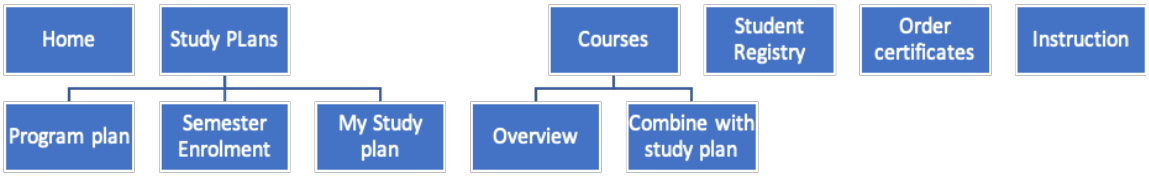

Figure 10. ASTA site map.

The study plans section will have three sub-categories, while the program plan shows all the courses related to the program. Semester enrollment includes subjects that are compulsory in the next semester. My study plan will give all the registered courses, categorized by periods. Based on the interview respondents' feedback, My study plan would be personalized to individual students and reflect their chosen module.

The Courses category is also a pivotal part of ASTA. In Course Overview, all the courses available at Arcada, including the subjects unrelated to the degree program, will be listed. Meanwhile, the Combine with the study plan tab will analyze which courses from the course database can be linked with the user's current study plan based on their preference.

The findings from section 4.2.1 are demonstrated in the below figures. The structure of the Home page will be similar to the current one (Figure 6), which comprises three columns with several boxes. Inside those boxes display further information that was deemed useful for the users. The interface for Courses and Study plans pages receives the most redesign and changes to create a cleaner look and provide direct access to users to the information that they need.

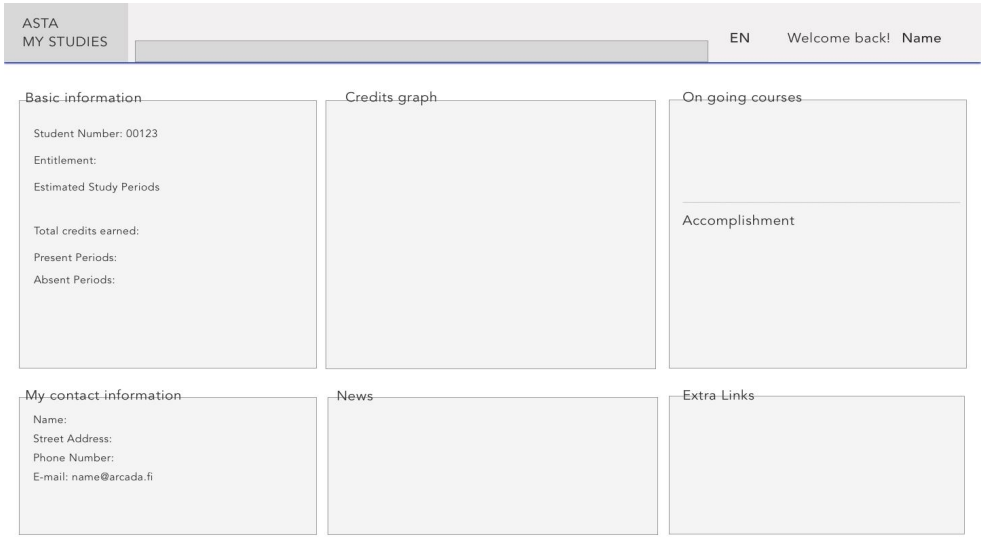

Figure 11. Structure of the home page.

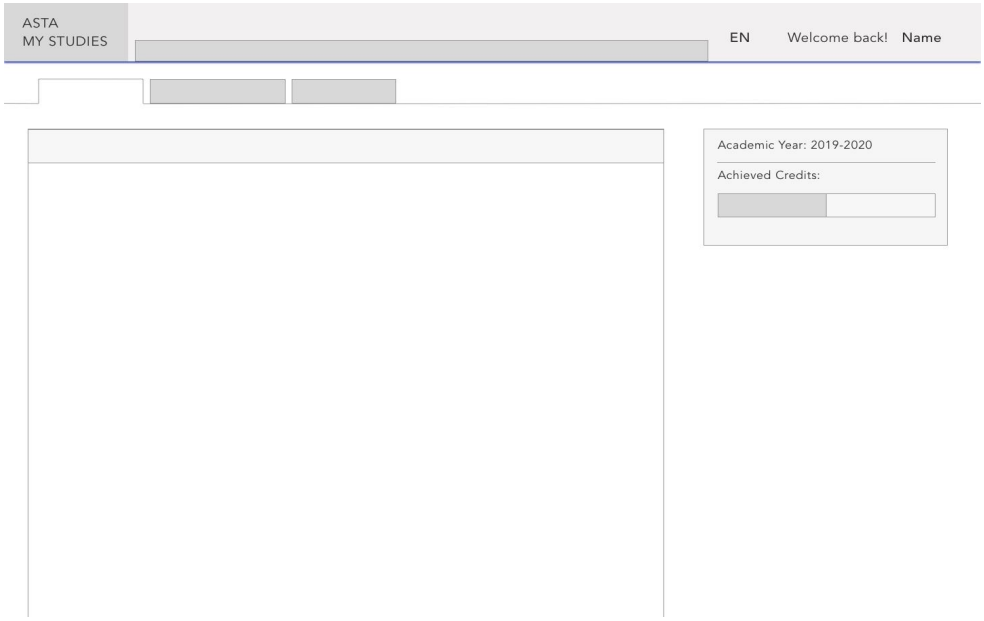

Figure 12. Structure of the Study Plans page and the Courses page.

4.3.3 **Skeleton**

The layout of the skeleton forms the shape and looks of the web page. Content such as buttons, controls, text, and photos are roughly depicted through sketches or wireframes to ensure the elements fit together nicely on a single page, and the information hierarchy is optimized for readability and comprehension. Having a skeleton wireframe allows the one to visually communicate their idea and make sure that the page has all the necessary information before moving on to creating the visual design interface. During this step, the author utilized the five characteristics of a good product by Whitney Quesenbery in section 2.3. An excellent usable product needs to be: Effective, Efficient, Engaging, Error Tolerant, and Easy to Learn. (Komninos, 2019)

To be more specific, the top navigation bar is introduced as a replacement for the current menu options (figure 9, 10). With a distinct array of options, the functions and navigation of ASTA are clear and easy to understand. Users can perform any of their tasks effectively and efficiently without having to go through multiple layers of information.

The top right corner will be much cleaner as most of the previous functions are hidden away. The language choice will be highly visible next to a user profile box with a “Welcome back!” sentence to add a more personal touch whenever the users log in to the site. The content of the Home page is kept roughly similar to the current website, which includes necessary information, contact information, on-going courses, and news. Having similar interface elements and not so different layouts creates a sense of familiarity and predictability, allowing the users to interact with the new design interface with ease.

The most crucial information, which is accomplished credits and on-going credits, is placed at the center of the web page. A graph is an excellent method to depict this information, as it is not only visually attractive but also can present the number of credits through various periods. Per request from the interviewees, extra links are added at the bottom right corner to give users quick access to external sites, boosting the website's efficiency.

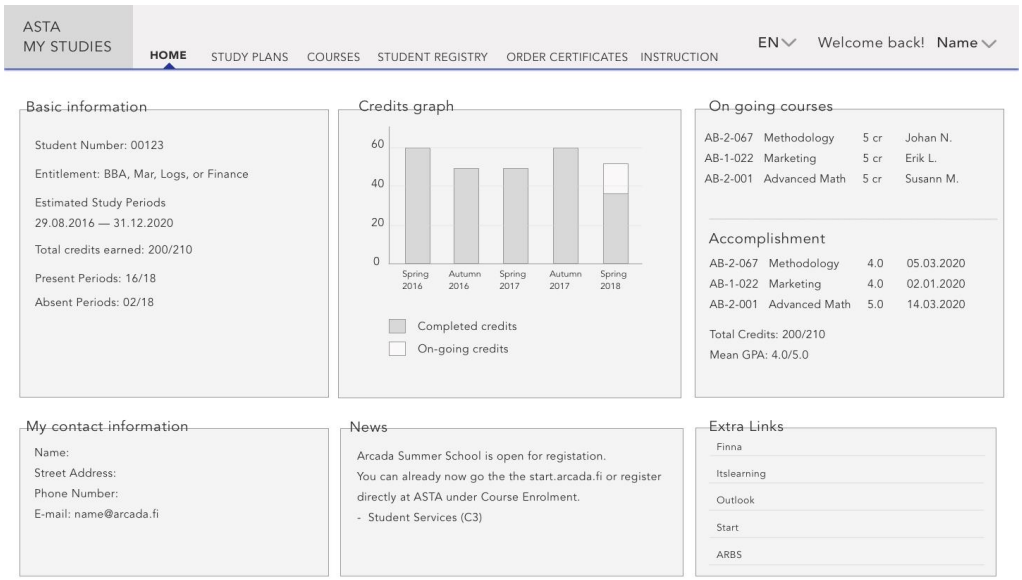

Figure 13. The skeleton of the Home page.

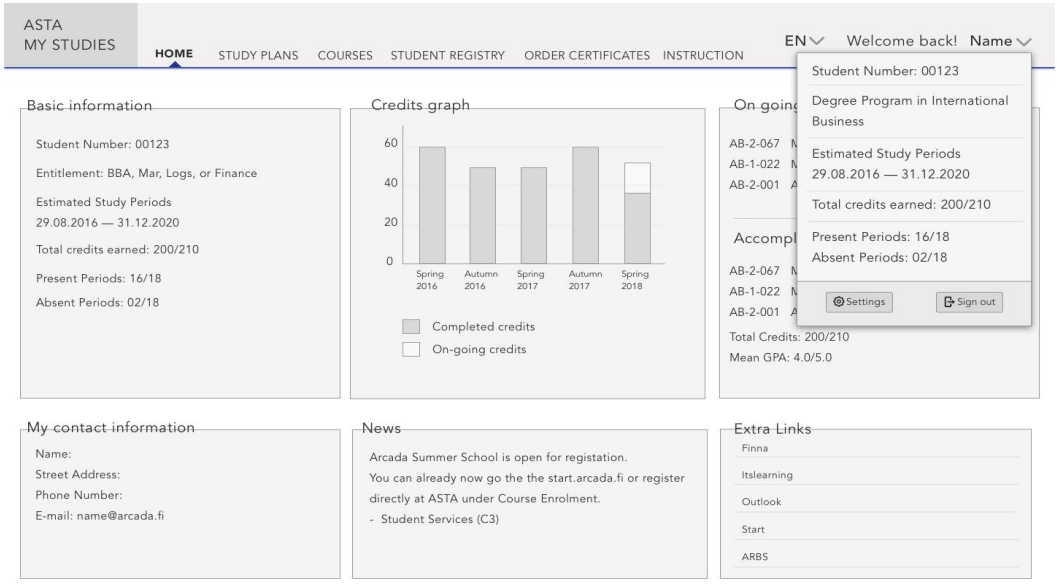

Figure 14. The skeleton of the Home page, with the profile box.

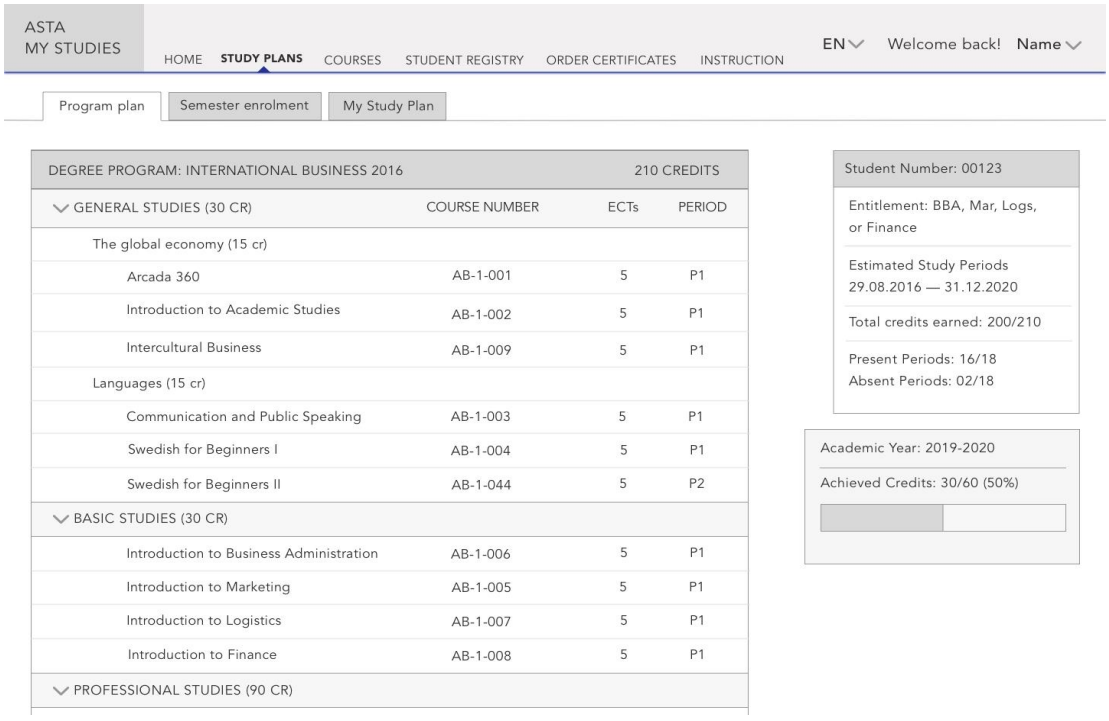

Figure 15. The skeleton of the study plans page.

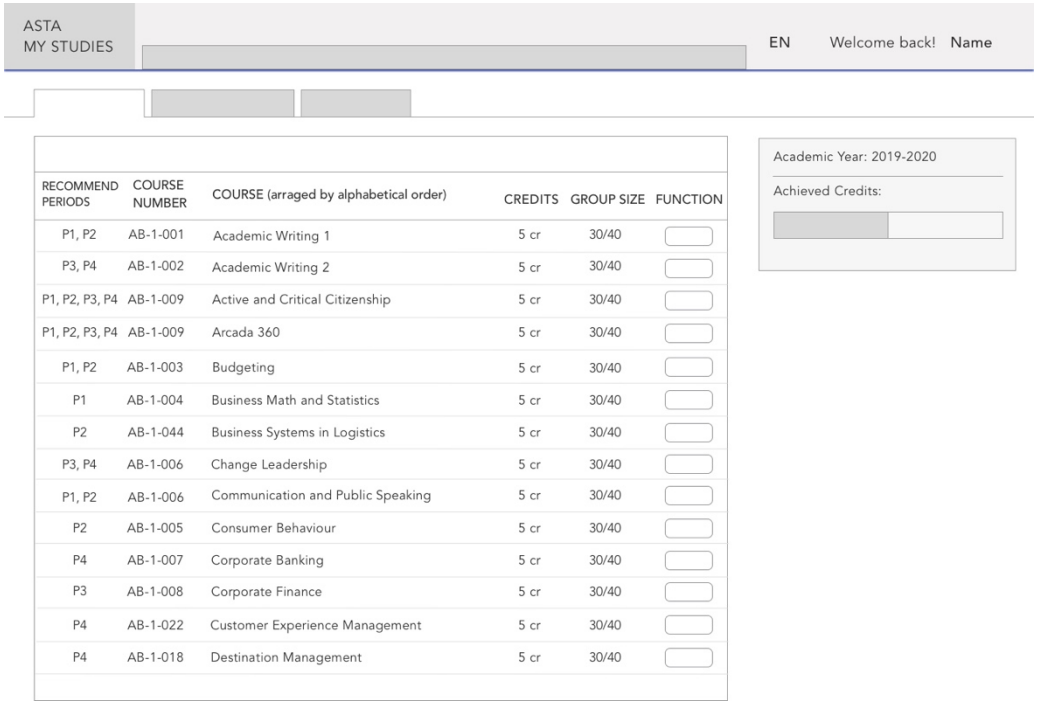

Figure 16 The skeleton of the Courses page

In the Study Plans and Courses tab, the presentation of the course information is kept roughly the same as the current site, as there are not many complaints about this matter, and the information hierarchy is clear enough. Nevertheless, a new box with necessary information about the user, specifically student number, study periods, degree program, credits, and attendance, is situated next to the course table to provide the essential information to the users frequently.

4.3.4 **Surface:**

The surface combines all the content and visual design into a complete composition that appeals to the users' senses. The illustration below only depicts still images of the outcome of the Home Page, Study Plan page, and Courses page. A style guide (see Appendix B) is included as part of the design process to document all of the design decisions on colors, typography, logo, and page grids. Style guides, also known as design-informing models in a UX cycle, is a prerequisite for the design process to go about smoothly and effectively. It can be useful for future implementation and development work when a different person will likely take up the designer role. The following figures are the wireframes for the ASTA website, which are based on suggestions from the interview

participants and the author's judgment on aesthetics. The final designs consist of the Home Page, the Study Plans page, and the Courses page.

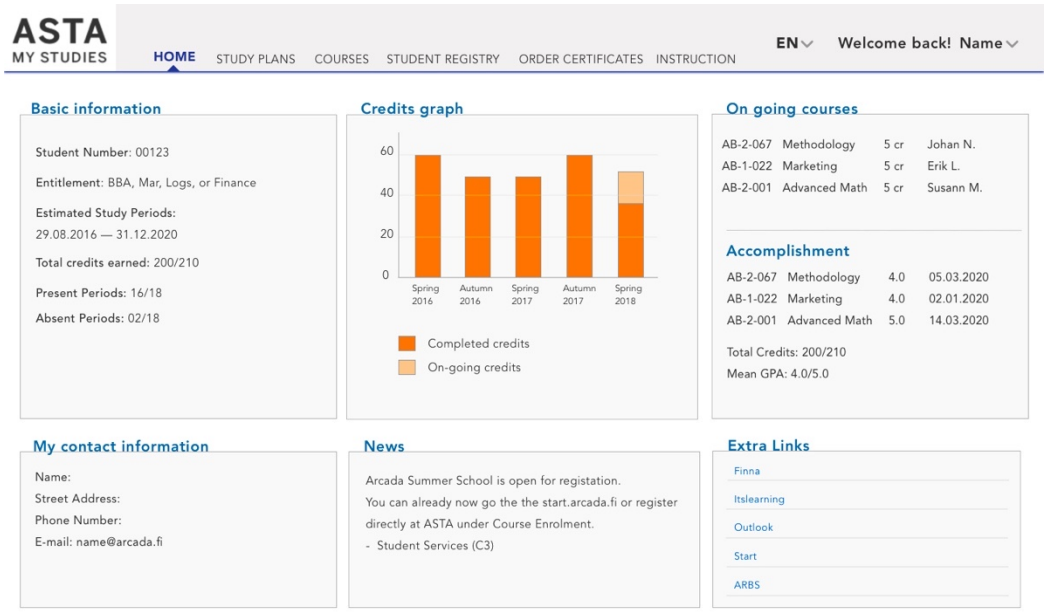

Figure 17 The Surface of the Home Page

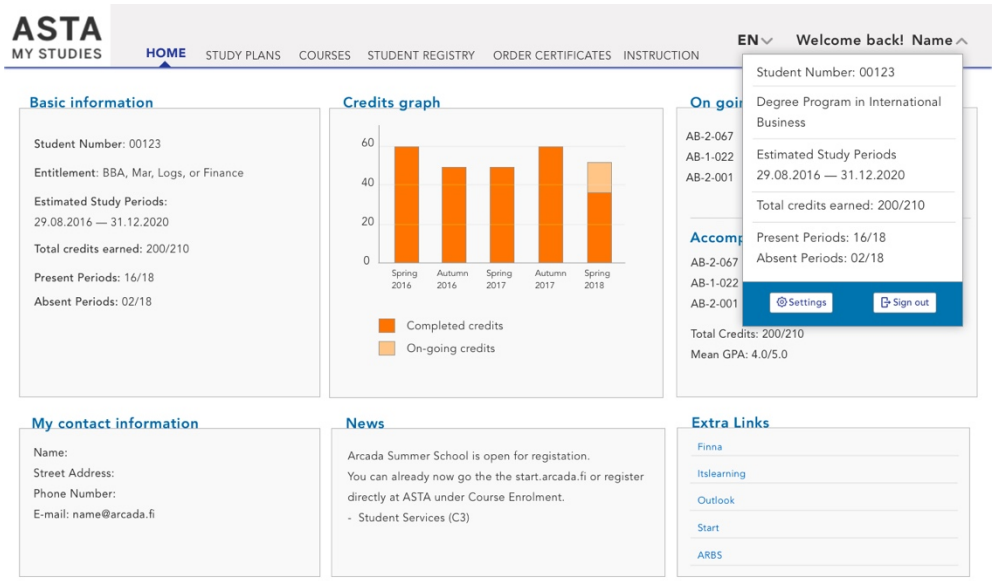

Figure 18 The surface of the Home page, with the profile box

On this page, a small profile box is included on the top right corner to illustrate the interaction when the user clicks on their name, and a hover box will appear. This box

includes additional information about the user, extra settings and log out function. The box appears whenever the user clicks on their name and does not only happen on the home page.

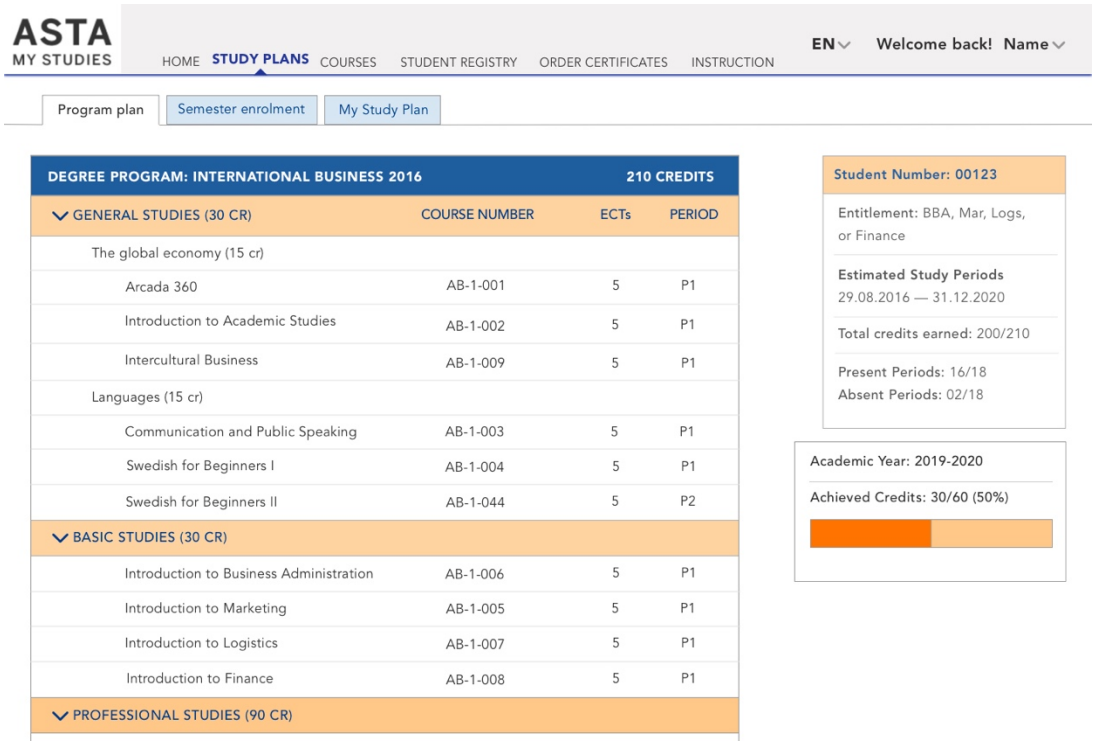

Figure 19 The Surface of the Study Plans page

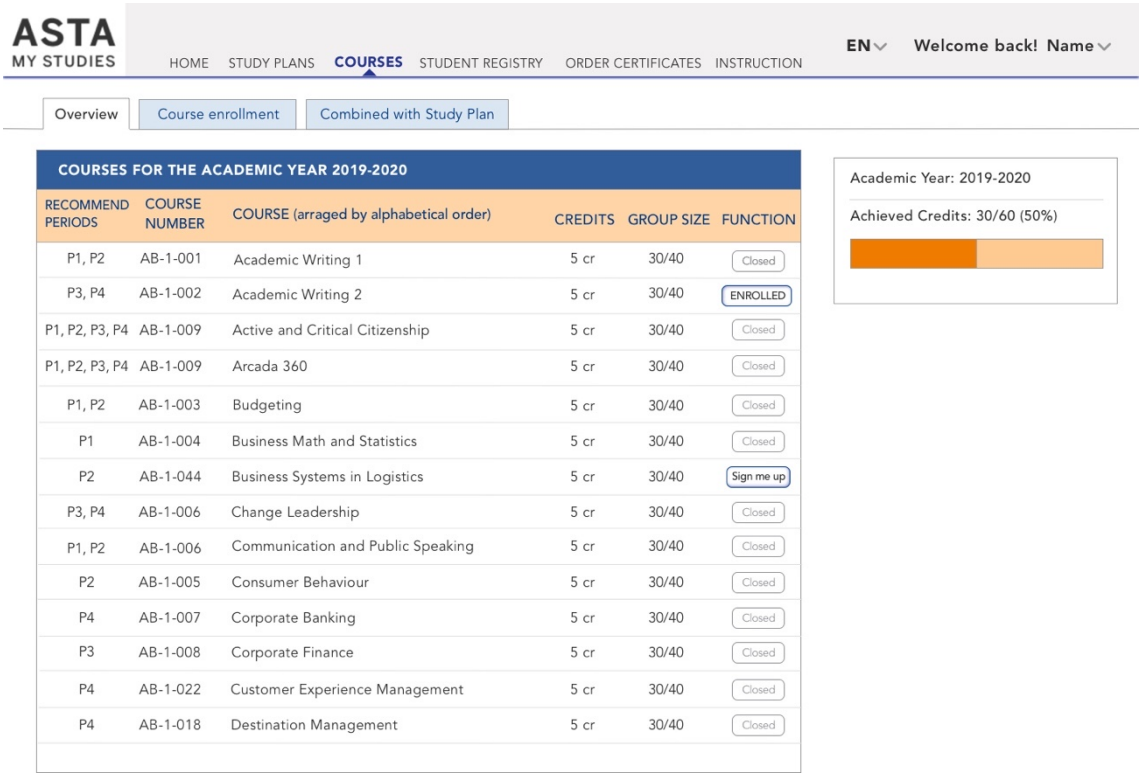

Figure 20 The Surface of the Courses page

5 DISCUSSION

This research aims to design the ASTA website's visual interface by adopting the UX Design Framework rule. Besides understanding the UX design's theoretical background, the author needs to draw conclusions regarding the current state of the web site and suggest how it should be redesigned to suit the users' needs. This practice does not only act as a means for the author to expand one's knowledge horizon and gain new skill sets but also to provide empirical evidence to support the theory above as an answer to the research questions. The study shows that while the current ASTA website has a good foundation regarding usability and functionality, there is room for improvement on its UX and its underlying system to reach a level where the users can easily interact with the page without hindrance.

The process of data collection and data analysis followed the theory of Contextual Inquiry, and Contextual Analysis discussed in Chapter 2, section 1.2. For Contextual Inquiry, user interviews were done to understand the users' sensory and mental perceptions and transform those insights into data that would later be organized into Contextual Analysis. These were all sub-activity relating to the overall user experience cycle. After contextual studies, the learnings were put into creating design specifications or design-informing models that listed all the UX elements and visual features that support, inform, and inspire future design. After the preparation work, the author moved on to create rough sketches of the pages' interface on paper to get an idea of what the design looks like, then translated them into digital format to form mid-fidelity wireframes. The whole design process was carried out with the Design Thinking in mind. The five characteristics of a good product by Whitney Quesenber (2001), explained in the previous section, was very helpful in deciding UX design elements.

All of the discussed theories on Design Thinking, Action Research, UX Design, have one thing in common, and that is place a top priority on the users' perspective, or so-called user-centered. With that being said, the interview with the students had been done even before the design process. The learnings tremendously helped shape the overall design practice. Many valuable findings were only discovered from interacting with the users. It would not have been possible if the author had decided to go the traditional route of designing first and then test the product for feedback. While this whole study follows the User Experience Design Cycle (section 2.1.2), which takes into account the process before the actual design steps, the procedure of creating and building the product was based on the elements of user experience by James Garrett (section 2.1.1). This study also has given evidence that these techniques and guidelines are power tools in dealing with practical matters that require a quick and adaptive solution.

6 CONCLUSION

This thesis research set out to answer two distinct questions: why should UX design be implemented in web design, and what are the pain-points that Arcada students are currently experiencing with ASTA. A rigorous study of the perspectives of many big players

in the design industry, such as Don Norman from Nielsen Norman Group, Professor Marc Hassenzahl, has proved that UX design is a multi-disciplinary method that provides people not with just good enough product, but with the ones that they will need, love to use. The UX design cycle and Design Thinking paradigm theory explained perfectly how to practice UX design in almost every procedure. Furthermore, the author carried out an extensive investigation on the current ASTA website to understand the problems that Arcada students are having, which was mainly concerned with poor visual layouts and obscure information arrangement on the front page. In the end, the study fulfilled its primary purpose, which is a redesigned wireframe of ASTA student web for Arcada University of Applied Sciences based on the UX design framework.

There is a plethora of reference material at one's disposal due to the popularity of web design topics. Nevertheless, the author has strived for the most relevant and up-to-date information that can be the most useful for this thesis. Having understood the definition of UX Design and its importance, knowing how to creatively and purposefully implement the process is what will separate ordinary products and services and extraordinary ones. This research was limited to mainly take into account the visual attention of ASTA's front page and create mid-fidelity wireframes based on gathered learnings, but in future research, full web development or study by other websites of the same field could be of high interest.

6.1 Future Suggestions

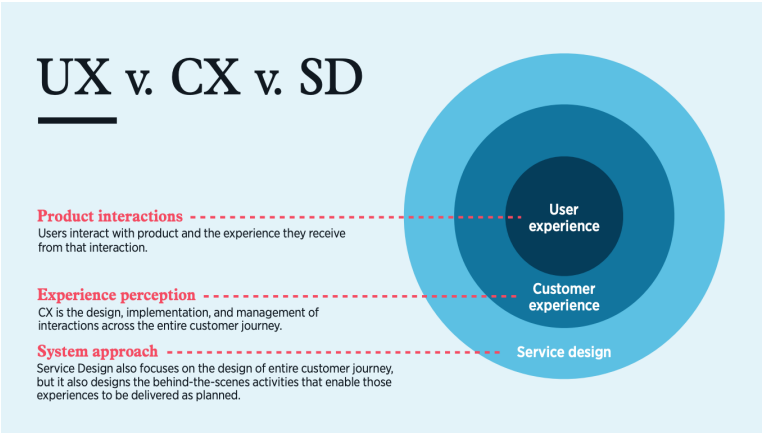

Figure 21. Differentiation among UX, CX, and SD (Adapted from Pham, 2017).

In conclusion, this research overall is a foundation and a starter guide for anyone who is interested in UX Design and wants to pursue a professional career path that is related to creating an unforgettable user experience. This thesis research focused on UX design in an educational entity and was limited to only the visual appearance and the user flow on the student web ASTA of Arcada University of Applied Sciences. Nevertheless, in the future, it could be used to develop further into a fully functional site with more development work on HyperText Markup Language (HTML) and (Cascading Style Sheets (CSS). These are two of the core technologies for building Web pages and Web Applications ((HTML & CSS - W3C, 2020). A similar procedure could be applied to draw UX insights and customer engagement on a mobile version of ASTA that allows immediate access to the student web. This experience requires that the running system of ASTA is up-to-date and can process sufficiently and effectively the large amount of data that ASTA holds.

Research has found that UX Design should be employed wherever there is an interaction, under any forms, between designers and the people whom they are designing for. Due to lack of time and resources, the limitation of this study would be the usability testing on the final product. The basis of User Experience in product interaction is an excellent stepping-stone to explore further the area of Customer Experience (CX) and Service Design (SD), which the whole customer journey is taken into account when designing, implementing, and managing interactions to create memorable and outstanding experiences. With that being said, design thinking is not necessarily restricted in the design community. In the simplest sense, Design Thinking and UX is a problem-solving mindset that can be implemented across multiple sectors and industries. In business, company managers and decision-makers will be able to see insight that is not so apparent through market research and can make decisions that can positively impact businesses in the long run by adopting a human-centric mindset.

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APPENDICES

Appendix A: Interview questions

- Q1: What do you often use ASTA for?
- Q2: Is the information provided on the ASTA front page enough for you? Or is it too much?
- Q3: On a scale of 1-5, how easy do you think it is to perform those tasks on ASTA? With one being the most difficult, and five being the easiest. If you have more than 1 task, please provide separate answers.
- Q4: What kind of information would you like to see on the ASTA front page?
- Q5: On a scale of 1-5, how easy do you think it is to perform those tasks on ASTA? With 1 being the most difficult, and 5 being the easiest. If you have more than 1 tasks on the previous question, please provide seperate answers.
- Q6: How would you like the ASTA front page to be? Use descriptive adjectives such as dark, fun, full of news, up to date?
- Q7: Other frustrations that you may experience with ASTA that you would like to share.

Appendix B: ASTA web interface style guide